

CLAIMS

What is claimed is:

1. A method for efficiently delivering data to a plurality of destinations, the method comprising:

- 5 (a) storing data to be delivered to a plurality of destinations;
- (b) dividing the data into blocks of a predetermined size;
- (c) pre-calculating a checksum for each of the blocks;
- (d) identifying portions of the data to be sent to the destinations; and
- 10 (e) calculating a checksum for the portion of the data to be delivered to each destination using the pre-calculated checksums for the blocks of the data included in each portion.

2. The method of claim 1 wherein storing data to be delivered to a plurality of destinations includes storing a stream of audio data to be delivered to a plurality of destinations.

- 15 3. The method of claim 1 wherein storing data to be delivered to a plurality of destinations includes storing a stream of video data to be delivered to a plurality of destinations.

4. The method of claim 1 wherein storing data to be delivered to a plurality of destinations includes storing a stream of audio and video data to be delivered to a plurality of destinations.

- 20 5. The method of claim 1 wherein pre-calculating a checksum includes calculating a running checksum for each block, the running checksum for the n^{th} block comprising the sum of the checksum of the n^{th} block and the running checksum for the $(n-1)^{\text{th}}$ block, n being an integer, and wherein
- 25 calculating a checksum for the portion of the data to be delivered to each

destination includes computing a difference checksum based on the running checksums for the first and last blocks of data included in the portion of data to be delivered to each destination.

6. The method of claim 1 wherein pre-calculating a checksum includes calculating a checksum based only on the data in each block and wherein calculating a checksum for the portion of data to be delivered to each destination comprises summing the pre-calculated checksums of each block in each portion of data to be delivered to each destination.

7. The method of claim 1 comprising combining the checksum for the portion of the data to be delivered to each destination with a packet header checksum used to deliver the data to each destination.

8. The method of claim 7 comprising forwarding the packets to each of the destinations.

9. The method of claim 8 wherein forwarding the packets to each of the destinations includes forwarding UDP datagrams to each of the destinations.

10. The method of claim 8 wherein forwarding the packets to each of the destinations includes forwarding TCP segments to each of the destinations.

11. A streaming media accelerator comprising:

(a) a checksum pre-calculator for dividing data into blocks of a pre-determined size and for pre-calculating a checksum for each of the blocks; and

(b) a packet checksum calculator operatively associated with the checksum pre-calculator for computing checksums for outbound

packets to be delivered to a plurality of destinations using the pre-calculated checksums.

12. The streaming media accelerator of claim 11 wherein the checksum pre-calculator is adapted to calculate a running checksum for the data, the running checksum for the n^{th} block comprising a sum of the checksum of the n^{th} block and the running checksum for the $(n-1)^{\text{th}}$ block, n being an integer.
13. The streaming media accelerator of claim 11 wherein the checksum pre-calculator is adapted to pre-calculate a checksum for each of the blocks of data and the packet checksum calculator is adapted to compute checksums for outbound packets by summing the checksums for each of the blocks of data.
14. The streaming media accelerator of claim 11 wherein the packet checksum calculator is adapted to pre-compute checksums for fixed header fields to be included in outbound packets.
15. The streaming media accelerator of claim 11 comprising a plurality of channel processors for receiving connection requests from the destinations and identify portions of the data to be sent to each of the destinations.
16. The streaming media accelerator of claim 15 wherein the packet checksum calculator is adapted to determine whether the portions of data to be sent to each of the destinations are an integer multiple of n blocks, n being an integer.

17. The streaming media accelerator of claim 16 wherein the packet checksum calculator is adapted to truncate data in each outbound packet to an integer multiple of n blocks.
18. The streaming media accelerator of claim 16 wherein the packet checksum calculator is adapted to compute a checksum for an outbound data packet using the portion of data to be included in the outbound data packet that is an integer multiple of n blocks and to calculate a remainder checksum for remaining data that is not an integer multiple of n blocks.
19. The streaming media accelerator of claim 11 comprising a plurality of buffers for storing a plurality of data streams, wherein the checksum pre-calculator is adapted to pre-calculate checksums for each of the blocks in each of the data streams.
20. The streaming media accelerator of claim 19 wherein the checksums for each block of data is associated in memory with the corresponding data.
21. A switch for delivering data received from a plurality of data servers to a plurality of data clients, the switch comprising: at least one streaming media accelerator for receiving data from the servers, pre-computing checksums for blocks of data received from each server, using the pre-computed checksums to calculate checksums for data packets to be sent to each client, and forwarding the data to each of the clients.
22. The switch of claim 21 wherein the streaming media accelerator is adapted to pre-calculate running checksums for blocks of data to be delivered to the clients and to use the running checksums to calculate the checksums for outgoing data packets.

23. The switch of claim 21 wherein the streaming media accelerator is adapted to calculate a one's complement checksum based only on the bits of each block of data and to sum the pre-calculated checksums in order to calculate the checksum for each outgoing data packet.

5 24. The switch of claim 21 comprising a chassis for holding a plurality of streaming media accelerators.

25. The switch of claim 24 wherein the chassis includes a high-speed backplane for connecting the plurality of streaming media accelerators.

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